

SPECIFIC MEMORANDUM OF AGREEMENT  
(SMA)

Attachment 1

Between

The Power Reactor and Nuclear Fuel Development Corporation of Japan (PNC)  
and  
The United States Department of Energy (DOE)

for Joint Systems Analysis Studies of Near-Real-Time Accounting for  
a Mixed Oxide Fuel Fabrication Facility

1. Introduction

An Agreement between PNC and DOE for Cooperation in Research and Development concerning Nuclear Material Control and Accounting Measures for Safeguards, was signed on March 31, 1988, and hereinafter referred to as the "Agreement". Under Article II of the Agreement, DOE and PNC now undertake to carry out a cooperative effort in systems analysis studies of near-real-time accounting (NRTA) at the PNC Plutonium Fuel Production Facility (PFPF), an automated plant for remote production of MOX fuel.

2. Scope of Work

This SMA provides for development of computer programs and analysis methods for use in systems studies analyzing NRTA of plutonium receipts, inventory and shipments at the PFPF. The work under this SMA shall be performed at the Los Alamos National Laboratory (LANL) under the terms and conditions set forth in the Agreement.

3. Program Management

LANL is the organization responsible for development of the computer programs, analysis methods and systems studies to be conducted under this SMA. The work to be done is identified in Appendix 1 and is limited to systems analysis work for safeguards. LANL shall transfer the computer programs developed under this project to PNC for their use. PNC shall participate jointly with LANL in the development of computer programs, analysis methods, and the writing of systems analysis studies for NRTA. PNC is responsible for providing design information, operating data, and other information required for completion of the systems studies. In addition, PNC shall assist LANL in obtaining information about planned inspection activities at PFPF from the International Atomic Energy Agency (IAEA).

The use of LANL and their management and operating personnel in carrying out the work is authorized on a non-interference basis, i.e., the work performed under this SMA shall not interfere with work related to the prime mission of LANL. Although DOE commitment to this effort is equal to DOE mission programs, DOE programs may, for reasons related to national security or exigency, preempt efforts in support of this SMA. Accordingly, the U.S. Government, DOE, LANL, and persons acting on their behalf shall make best efforts to perform services or furnish information or data hereunder.

PNC agrees to contribute funding for the costs of the systems analysis work described in Appendix 1 and to establish priorities among tasks within the program. DOE shall undertake to complete the systems analysis work on a best efforts basis within the availability of funding.

DOE and LANL shall work directly with PNC in planning tasks and resolving programmatic and technical questions. DOE shall ensure that work will start with development and circulation of a work plan with projected milestones for each task, and for updating the work plan as the work progresses.

DOE shall provide for brief bi-monthly letter progress reports on each task and circulate them to PNC, DOE, and to other pertinent organizations as requested by PNC.

DOE and PNC shall prepare and present written and oral reports at meetings of the Permanent Coordinating Group established under Article IV of the Agreement.

No publicity releases (including news releases and advertising) relating to this SMA and the work hereunder shall be issued by either party without prior coordination with the other Party. Any technical paper, article, publication or announcement of advances generated in connection with work done during the period of performance or in the future, shall give credit to PNC as a sponsor of the work and shall contain a mutually agreed disclaimer statement.

Articles V, VI, and VII of the Agreement (Appendix 3 below) pertaining to intellectual property rights are incorporated in this SMA. As noted in Article XII of the Agreement, all information transmitted by one Party to the other Party under this SMA shall be appropriate and accurate to the best knowledge and belief of the Supplying and Transmitting Party. The U.S. Government, DOE, LANL, and persons acting on their behalf, shall make best efforts to ensure that the use of any such information or data to be furnished hereunder does not infringe privately owned rights.

#### 4. Fiscal Management

The total cost of activities related to the completion of systems analysis studies for safeguards at the PFPF as defined in Appendix 1 of this SMA is 700,000 U.S. dollars. PNC shall make cash contributions in the following manner:

- a. A contribution of 175,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued upon or shortly after the date of signature of this SMA.
- b. A contribution of 325,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued after April 1, 1989. This payment is, however, subject to the approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal Year 1989.

- c. A contribution of 200,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued after April 1, 1990. This payment is however, subject to the approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal Year 1990.

All contributions by PNC shall be due and payable within 30 days of an invoice from DOE, subject to the availability of appropriated funds to PNC.

DOE shall be responsible for the budget planning and financial management and shall make best efforts to complete the PNC-funded activities in Appendix 1 satisfactorily and within the cash contributions by PNC. DOE costs are determined in accordance with DOE's policy for costing work it performs for others as set forth in 10 CFR Part 1009. The total cost to PNC for DOE's performance of work under this SMA shall not, without PNC's prior consent, exceed the contributions set forth above.

DOE shall not begin or carry out work prior to entry into force of the SMA and receipt of the required payment in advance; and work shall not be continued after funds from PNC have been depleted. Throughout the duration of work under this SMA, PNC shall provide sufficient funds in advance to reimburse DOE for causing LANL to perform the work described in this SMA, and DOE shall have no obligation to perform in the absence of adequate advance funds. Payment in advance from PNC shall be sufficient to cover the expected obligation and cash requirements of the work until a subsequent request for payment in advance can be made, collected, and recorded. In this regard, sufficient advance funds shall be provided to maintain, at a minimum, a continuous 90 day advance of funds for expected DOE fund requirements during the life of this SMA. Advances shall be sufficient to cover expected termination costs that DOE would incur on behalf of PNC.

#### 5. Indemnification

PNC agrees to indemnify and hold harmless the U.S. Government including DOE, LANL, and persons acting in their behalf in connection with work under this SMA from all liability, including costs and expenses incurred, resulting from use or disclosure by PNC of any information in whatever form, furnished hereunder.

#### 6. Duration and Termination

This SMA shall enter into force upon the later date of signature, and shall continue in force for a 4 year period, or until mutually agreed by the Parties that all activities under this SMA are completed, or at the discretion of either party upon 6 months notice.

Executed on this 30<sup>th</sup> day of November, 1988.

For the United States Department  
of Energy

Name: F. Charles Gilbert  
F. Charles Gilbert  
Deputy Assistant Secretary  
for Security Affairs

For the Power Reactor and Nuclear Fuel  
Development Corporation of Japan

Name: Shinichi Tsukada  
Shinichi Tsukada  
Director, Technical Management  
Division

## SPECIFIC MEMORANDUM OF AGREEMENT (continued)

### APPENDIX I

#### 1. Study Outline

This program involves the development of computer programs and analysis methods for use in systems analysis studies of NRTA at the PFPF. Phase I of this study will include use of design information for an analysis of the NRTA system to determine its performance capability in detecting material loss, and its performance capability for determination of the attributes and variables sample sizes for achieving IAEA safeguards goals for verifying the operators data during a single balance period. Phase II will include use of operating data to determine the operational performance of the NRTA system in detecting material loss, and development of an analysis method for determining inspection sample sizes for verification of an NRTA system. Phase III will include study and evaluation of MOX holdup in PFPF process equipment.

##### a. Evaluation of NRTA Performance

DOE and LANL will develop a simulation of the NRTA system based on either design information or operating data for the purpose of determining the performance of the NRTA system in detecting material loss. The simulation will establish the timeliness and probability of detection for a range of diversion scenarios.

##### b. Inspection Sampling Plans

DOE and LANL will develop methods for determining attributes and variables sampling plans for achieving IAEA safeguards goals at PFPF. Initially the sample plans will be developed for a single balance period based on a minimization of the variance of the D statistic subject to a constraint on available inspection effort. In subsequent work a similar analysis method will be developed that takes into account the multiple-balance aspects of verifying an NRTA system.

#### 2. Site

All phases of this work, except for visits to obtain information or present and discuss results, will be conducted at LANL, Los Alamos, New Mexico, United States of America.

#### 3. Programmatic Responsibilities

- a. DOE and LANL will be responsible for providing their best efforts within the funding and schedule for the systems analysis work. Personnel assistance office and laboratory space and use of facilities will be available for a PNC representative at LANL. Any tests or technical assistance shall be provided on a non-interference basis with existing DOE and LANL programs.

- b. PNC will be responsible for providing information about PFPF design and operation.

As more detailed program plans are developed, specific responsibilities will be better defined and delineated.

#### 4. Schedule

	1988				1989				1990				1991				1992			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Tasks																				
a. NRTA Evaluation																				
- Phase I				X	X															
- Phase II						X	X	X	X	X	X									
- Phase III										X	X	X	X	X	X	X	X	X	X	
b. Inspection Sampling Plan																				
- Phase I				X	X															
- Phase II						X	X	X	X	X	X									
- Phase III										X	X	X	X	X	X	X	X	X	X	

SPECIFIC MEMORANDUM OF AGREEMENT (continued)

APPENDIX II

Key Personnel

A. PNC

1. Technical

Mitsuaka Kajiyoshi, Director  
Safeguards Office  
Tokyo

2. Administrative

Tadatomo Yamaguchi, General Manager  
International Cooperation Office, Tokyo

B. Department of Energy

1. DOE Headquarters

William C. Bartels, Supervisory Physical Scientist, Division of  
Safeguards, and David Crawford, International Safeguards Branch  
Office of Safeguards and Security  
Washington, D.C. 20545

2. DOE-Albuquerque Operations Office

Robert Y. Lowery, Director and Samuel Mares  
Reimbursable and Defense Technologies Division  
DOE/Albuquerque Operations Office  
P.O. Box 5400  
Albuquerque, New Mexico 87115

C. Los Alamos National Laboratory

Jack T. Markin  
MS E 541  
Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

**AGREEMENT**

**between**

**The Power Reactor and Nuclear Fuel Development Corporation of Japan (PNC)  
and  
The United States Department of Energy (DOE)**

**for Cooperation in Research and Development Concerning Nuclear  
Material Control and Accounting Measures for Safeguards**

**Article I--Objective**

Cooperation between the DOE of the United States and the PNC of Japan (the Parties) shall be directed at improving the efficiency and effectiveness of equipment and techniques for safeguards to implement policies and procedures pursuant to the Non-Proliferation Treaty.

**Article II--Areas of Cooperation**

Cooperation under this Agreement shall include: research, development, demonstration, and evaluation of new equipment and techniques. Detailed areas of cooperation shall be defined in Specific Memoranda of Agreement (SMAs) subordinate to this Agreement. One such area shall include the application of remote controlled nondestructive assay techniques to the PNC Plutonium Fuel Production Facility (PFPF) and authentication techniques for containment and surveillance systems at the PFPF.

**Article III--Methods of Cooperation**

Cooperation under this Agreement may include but is not limited to the following forms:

- A. Exchange of scientists, engineers, and other specialists for participation in agreed research, development, test, demonstration, analysis, design, and experimental joint activities conducted in scientific centers, laboratories, engineering offices, and facilities of each of the parties or its contractors for agreed periods;
- B. Exchange or loan of samples, materials, equipment, and components for testing;
- C. Exchange of scientific and technical information including results and methods of research and development; and
- D. Joint projects in which the Parties agree to share the work and/or costs. Each said joint project shall be the subject of a written SMA between the Parties.



As mutually agreed in advance by the Parties, the costs of various activities under this Agreement may either be shared by the Parties with each Party bearing all the costs of its participation in the activity, or one Party may make cash contributions toward the costs of the other Party in order to ensure a mutually equitable balance of costs and benefits.

#### Article IV--Management

- A. All activities to be carried out under this Agreement shall be approved and monitored by a Permanent Coordinating Group (PCG). The PCG shall consist of equal numbers of representatives from each Party. As mutually agreed, the PCG shall meet to evaluate the status of cooperation under this Agreement. Members of the PCG shall invite to such meetings members of other organizations in their respective countries which have an interest in the results of the research and development activities of the joint program. Such meetings may be held alternately in Japan and the United States unless otherwise mutually agreed by the Parties.
- B. Technical management of the cooperation under this Agreement shall be carried out by Project Leaders designated by the Coordinators. Project Leaders shall be responsible for the working contacts between the Parties in their respective areas of cooperation.

#### Article V--Information

- A. The Parties shall support the widest possible dissemination of information provided or exchanged under this Agreement subject to the need to protect proprietary information, and subject to patent and to copyright restrictions.
- B. Use of proprietary information.

##### Definitions:

- (i) The term "information" means scientific or technical data, results or methods of research and development, and any other information intended to be provided or exchanged under this Agreement.
- (ii) The term "proprietary information" means information developed prior to or outside this Agreement which contains trade secrets or knowhow or commercial or financial information which is privileged or confidential, and may only include such information which:
  - (a) has been held in confidence by its owner;
  - (b) is of a type which is customarily held in confidence by its owner;

- (c) has not been transmitted by the transmitting Party to other entities (including the receiving Party) except on the basis that it be held in confidence; and
- (d) is not otherwise available to the receiving Party from another source without restriction on its further dissemination.

#### C. Procedures

- (i) A Party receiving proprietary information pursuant to this Agreement shall respect the privileged nature thereof. Any document which contains proprietary information shall be clearly marked by the providing Party with the following (or substantially similar) restrictive legend:

"This document contains proprietary information furnished in confidence under an agreement between the U.S. Department of Energy and the Power Reactor and Nuclear Fuel Development Corporation of Japan of \_\_\_\_\_ and shall not be disseminated outside these organizations, their contractors, and the concerned departments and agencies of the Governments of the United States and Japan without prior approval of \_\_\_\_\_."

This notice shall be marked on any reproduction hereof, in whole or in part. These limitations shall automatically terminate when this information is disclosed by the owner without restriction."

- (ii) Proprietary information received in confidence under this Agreement may be disseminated by the receiving Party to:
  - (a) persons within or employed by the receiving Party and to concerned Government departments and Government agencies of the receiving Party; and
  - (b) prime contractors or subcontractors of the receiving Party located within the geographical limits of the Party's nation, for use only within the framework of their contracts with the receiving Party in work relating to the subject matter of the proprietary information; provided that any proprietary information so disseminated shall be pursuant to an Agreement of confidentiality and shall be marked with a restrictive legend substantially identical to that appearing in subparagraph V. C. (i) above.
- (iii) With the prior written consent of the Party providing proprietary information under this Agreement, the receiving Party may disseminate such proprietary information more widely than otherwise permitted in subparagraph V. C. (ii) above. The Parties shall cooperate with each other in developing procedures for requesting and obtaining the prior written consent for such wider dissemination, and each Party shall grant such approval to the extent permitted by its national policies, regulations, and laws.

- D. If one of the Parties becomes aware that it will be, or may reasonably be expected to become unable to meet the non-dissemination provisions of this article, it shall immediately inform the other Party. The Parties shall thereafter consult to define an appropriate course of action.
- E. Information arising from seminars and other meetings arranged under this Agreement and information arising from the attachments of staff shall be treated by the Parties according to the principles of this Agreement provided, however, no proprietary information orally communicated shall be subject to the limited disclosure requirements of this article unless the individual communicating such information places the recipient on notice as to the proprietary character of the information communicated at the time of or prior to such communication.
- F. Information transmitted by one Party to the other Party under this Agreement shall be accurate to the best knowledge and belief of the transmitting Party, but the transmitting Party does not warrant the suitability of the information transmitted for any particular use or application by the receiving Party or by any third Party. Information developed jointly by the Parties shall be accurate to the best knowledge and belief of both Parties. Neither Party warrants the accuracy of the jointly developed information nor its suitability for any particular use or application by either Party or by any third Party.

#### Article VI--Patents

- A. With respect to any invention or discovery made or conceived in the course of or under this Agreement:
  - (i) If made or conceived by personnel of one Party (the Assigning Party) or its contractors while assigned to the other Party (the Receiving Party) or its contractors in connection with exchanges of scientists, engineers, or other specialists:
    - (a) The Receiving Party shall acquire all rights, title, and interest in and to any such invention or discovery in its own country and in third countries, subject to a nonexclusive, irrevocable, royalty-free license to the Assigning Party, its government, and its nationals designated by it in all such countries.
    - (b) The Assigning Party shall acquire all rights, title, and interest in and to any such invention or discovery in its own country, subject to a nonexclusive, irrevocable, royalty-free license to the Receiving Party, its government, and its nationals designated by it.
  - (ii) If made or conceived by a Party or its contractors as a direct result of employing information which has been communicated to it under this Agreement by the other Party or its contractors or communicated during seminars or other joint meetings, the Party making the invention shall acquire all rights, title, and interest in and to such inventions or discoveries in all countries, subject to a grant to the other Party, its government, and its nationals designated by it of a royalty-free nonexclusive, irrevocable license in all countries.

(iii) With regard to other specific forms of cooperation, the Parties shall provide for the appropriate distribution of rights to inventions or discoveries resulting from such cooperation. In general, however, each Party should normally own the rights to such inventions in its country subject to a nonexclusive, irrevocable, royalty-free license to the other Party, its government, and its nationals designated by it, and the right in third countries should be agreed to by the Parties on an equitable basis.

B. Each Party shall, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the cooperation from its inventors or authors required to carry out the provisions of this Agreement. Each Party shall assume the responsibility to pay awards and compensation required to be paid to its own nationals according to its own laws.

#### Article VII--Copyrights

Copyrights of the Parties or cooperating organizations and persons shall be accorded treatment consistent with internationally recognized standards of protection. As to copyrights on materials within the scope of above Article II owned or controlled by a Party, that Party shall make efforts to grant to the other Party a license to reproduce copyrighted materials.

#### Article VIII--Exchange of Equipment

Both Parties agree that in event equipment is to be provided by a Supplying Party to a Receiving Party for use in activities under this Agreement, the following provisions shall apply covering the shipment and use of agreed equipment:

- A. The Supplying Party shall supply as soon as possible a detailed list of the equipment to be provided together with the relevant specifications and technical and informational documentation.
- B. Equipment and spare parts provided by the Supplying Party under this Agreement shall become the property of the Receiving Party unless other arrangements are mutually agreed in advance and in writing.
- C. Equipment provided by the Supplying Party under this Agreement shall be brought into operation by the Supplying Party at the establishment of the Receiving Party unless other arrangements are mutually agreed in advance and in writing.
- D. Responsibility and expenses for the transport of equipment and materials from the Supplying Party by plane or ship to an authorized port of entry of the Receiving Party convenient to the ultimate destination, and also responsibility for the safekeeping and insurance en route, shall rest with the Supplying Party.

- E. All equipment exchanged between the Parties for carrying out joint projects under this Agreement shall be considered to be of a scientific and not a commercial character.
- F. The Receiving Party shall be responsible for safekeeping and insurance en route from the authorized port of entry to the ultimate destination.

#### Article IX--Exchange of Staff

The following provisions shall apply concerning exchanges of staff:

- A. Whenever an exchange of staff is contemplated each Party shall ensure the selection of adequate staff with skills and competence necessary to conduct the activities planned under this Agreement. Each such attachment of staff shall be mutually agreed in advance by an exchange of letters between the Parties, referencing this Agreement.
- B. Each Party shall be responsible for the salaries, insurance, and allowances to be paid to its staff.
- C. Each Party shall pay for the travel and living expenses of its staff when staying at the establishment of the host Party unless otherwise agreed.
- D. The host establishment shall arrange for adequate accommodations for the other Party's staff and their families on a mutually agreeable reciprocal basis.
- E. Each Party shall provide all necessary assistance to the staff of the other Party as regards administrative formalities.
- F. The staff of each Party shall conform to the general rules of work and safety regulations in force at the host establishment.

#### Article X--Damages

Both Parties agree that compensation for damages incurred under this Agreement shall be in accordance with the laws of the countries of the Parties.

#### Article XI--Industrial Property

The provisions of this Agreement shall not affect the rights or duties of the Parties specified theretofore under other agreements or arrangements. This Agreement also in no way precludes commercial firms or other legally constituted enterprises in each of the two countries from engaging in commercial dealings in accordance with the applicable laws of each country; nor does it preclude the Parties from engaging in activities with other governments or persons, except that industrial property of a proprietary nature shall have limited dissemination as set forth in Articles V and VI of this Agreement.

#### Article XII--Disclaimer

All equipment supplied and information transmitted by one Party to the other Party under this Agreement shall be appropriate and accurate to the best knowledge and belief of the supplying and transmitting Party, but the Party does not warrant the accuracy, completeness, usefulness, or suitability of any equipment or services supplied or information or data transmitted for any particular use or application by the receiving Party or by any third Party. All equipment and information developed jointly by the Parties shall be accurate to the best knowledge and belief of both Parties. Neither Party warrants the accuracy of the jointly developed equipment and information nor its suitability for any particular use or application by either Party or by any third Party.

#### Article XIII--Observation

If one Party finds it necessary, the Party has a right to observe activities under this Agreement in a facility of the other Party, subject to the approval of the other Party. A Receiving Party shall have a right to inspect equipment to be supplied at the facility of the Shipping Party before shipment.

#### Article XIV--Legal Provisions

Each Party's activities under this Agreement shall be in accordance with its national laws and regulations and the applicable Agreement for Peaceful Nuclear Cooperation between the Governments of the Parties. All questions related to this Agreement shall be settled by the Parties by mutual agreement.

#### Article XV--Finance

A Party (Contributing Party) may make cash contributions to the other Party (the Performing Party) as mutually agreed, to support activities directed at improving the application of safeguards techniques to a facility of the Contributing Party. Arrangements for specific contributions are to be incorporated as mutually agreed in SMAs under Article II of this Agreement. The ability of each Party to carry out obligations under this Agreement is subject to the appropriation of necessary funds by the Governments of the United States and Japan.

#### Article XVI--Duration and Termination

This Agreement shall enter into force upon signature and shall continue for a 5 year period, and may be extended or modified by mutual consent of the Parties. This Agreement may be terminated upon 1 year advance notification in writing by the Party seeking to terminate. If an activity in an SMA funded by a Contributing Party is terminated prior to completion, the Performing Party shall refund to the Contributing Party the uncoded remainder of its cash

contribution, excluding the cost of any mutually agreed close-out costs for the activity. Such termination shall be without prejudice to the rights which may have accrued under this Agreement to either Party up to the date of such termination.

Executed at \_\_\_\_\_ on this 31 of March 1988

For the United States  
Department of Energy

Name: F. L. Gilbert  
Acting Deputy Assistant  
Title: Secretary for Security  
Affairs

For the Power Reactor and Nuclear  
Fuel Development Corporation of Japan

Name: S. Tanaka  
Director Technical  
Title: Management Division